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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/536,560

Applicant(s)

BENTWICH, ITZHAK

Examiner

DANA SHIN

Art Unit

1635

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2009 and 08 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-48 and 50-55 is/are pending in the application.
- 4a) Of the above claim(s) 35-48, 51, 54 and 55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-34, 50, 52 and 53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Application/Amendment/Claims

This Office action is in response to the communications filed on March 16, 2009 and April 8, 2009.

Currently, claims 21-48 and 50-55 are pending in the instant application. Claims 35-48 and 51 have previously been withdrawn as being drawn to non-elected inventions. Newly added claims 54 and 55 depend from a withdrawn claim, claim 35. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 54 and 55 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Accordingly, claims 21-34, 50, and 52-53 are under examination on the merits.

The following rejections are either newly applied or are reiterated and are the only rejections and/or objections presently applied to the instant application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments and Amendments

Withdrawn Rejections

Any rejections not repeated in this Office action are hereby withdrawn.

Maintained Rejections

Claim Rejections - 35 USC § 112

Claims 21-34 and 50 remain rejected under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement for the reasons of record as set forth in the Office action mailed on September 16, 2008 and for the reasons stated below.

Applicant's arguments filed on March 16, 2009 have been fully considered but they are not persuasive. Applicant argues that the instant specification fully complies with the written description requirement because all of the “disclosed” and “amended claimed” possess “common attributes and features”. It is found that applicant’s argument is based on fragmented bits and pieces of disclosure collected from different parts of the specification and sequences. That is, there is no single miRNA disclosed in the specification that fully satisfies the “amended claimed” miRNA nucleotide. Further, even if the specification adequately discloses a single miRNA nucleotide sequence that fully satisfies all the structural limitations, attributes and features, the single disclosed species is not representative of the extremely broad genus of the claimed nucleotide. Note that the written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species. A “representative number of species” means that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus. The disclosure of only one species encompassed within a genus adequately describes a claim directed to that genus only if the disclosure “indicates that the patentee has invented species sufficient to constitute the gen[us].” See *Enzo Biochem*, 323 F.3d at 966, 63 USPQ2d at 1615; *Noelle v. Lederman*, 355

F.3d 1343, 1350, 69 USPQ2d 1508, 1514 (Fed. Cir. 2004) (Fed. Cir. 2004)(“[A] patentee of a biotechnological invention cannot necessarily claim a genus after only describing a limited number of species because there may be unpredictability in the results obtained from species other than those specifically enumerated.”). See also MPEP §2163.

In light of the above, the instant specification does not clearly allow persons of ordinary skill in the art to recognize that the inventors invented the genus claimed in the instant case. See *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1562, 19 USPQ2d 1111, 1115 (Fed. Cir. 1991), which clearly states that “applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of *the invention*. The invention is, for purposes of the ‘written description’ inquiry, *whatever is now claimed*.” (see page 1117). In view of the foregoing, this rejection is maintained.

Claim Rejections - 35 USC § 102

Claims 21-22, 25, and 33-34 remain rejected under 35 U.S.C. 102(e) as being anticipated by Zamore et al. for the reasons of record as set forth in the Office action mailed on September 16, 2008 and for the reasons stated below.

Applicant's arguments filed on March 16, 2009 have been fully considered but they are not persuasive. Applicant argues that Zamore et al. do not “recite a viral hairpin precursor or miRNA sequence in anyway”. It appears that applicant seems to think an explicit recitation of the exact terms “viral hairpin precursor” and “miRNA” is required to anticipate the claimed nucleotide. First, applicant’s attention is directed to the fact that none of the claims under examination recites “miRNA” or “hairpin precursor” either. Hence, examiner does not

understand why absence or presence of such terms is critical determinant for anticipation prior art rejection. Second, as stated in the last Office action, Zamore et al. explicitly disclosed an "engineered RNA precursor" comprising two stem portions connected by a hairpin loop sequence, which fully read on the claimed nucleotide structure. Furthermore, Zamore et al. explicitly disclosed the term "stRNA" and "stRNA precursor", which is synonymous with miRNA and miRNA precursor, as applicant should be aware. See paragraph 0041. In addition, Zamore et al. taught that the two stem portions are mature miRNA sequences that can target a viral gene. See paragraphs 0007-0009, 0042, 0046-0048; SEQ ID NOS:1, 2, 3, 4, 5, 8, 9, 10, 11, 17, 18, 20, 21; claims 1-14, 18.

Applicant further argues that the claimed nucleic acid requires that the miRNA sequence be viral, not the target gene be viral. Applicant's attention is directed to the fact that the "viral nucleic acid" claimed in the instant case is not defined in the specification, and as such, there is no requirement as alleged by applicant that the claimed nucleic acid be viral. Given the broadest reasonable interpretation of the claims, the "viral nucleic acid" is interpreted as a nucleic acid that targets and modulates viral nucleic acid (e.g., viral gene). Hence, the nucleic acids of Zamore et al. not only satisfy the structural limitations but also functional limitations of the claimed "viral nucleic acid". In view of the foregoing, this rejection is maintained.

Claims 21-22, 25, and 33-34 remain rejected under 35 U.S.C. 102(e) as being anticipated by Cullen et al. for the reasons of record as set forth in the Office action mailed on September 16, 2008 and for the reasons stated below.

Applicant's arguments filed on March 16, 2009 have been fully considered but they are not persuasive. Applicant argues that Cullen et al. fail to suggest a viral hairpin precursor or miRNA sequence in anyway. Contrary to applicant's argument, Cullen et al. disclosed miRNA hairpin precursor structures as self-evidenced by applicant's argument addressing "artificial miRNA precursor" of Cullen et al. Applicant further argues that the artificial miRNA precursor of Cullen et al. is not a viral sequence and therefore the teachings of Cullen et al. are irrelevant since the claims require that the nucleic acid be a viral sequence. Applicant's attention is directed to the fact that the "viral nucleic acid" claimed in the instant case is not defined in the specification, and as such, there is no requirement as alleged by applicant that the claimed nucleic acid be viral. Given the broadest reasonable interpretation of the claims, the "viral nucleic acid" is interpreted as a nucleic acid that targets and modulates viral nucleic acid (e.g., viral gene). Hence, the nucleic acids of Cullen et al. not only satisfy the structural limitations but also functional limitations of the claimed "viral nucleic acid". In view of the foregoing, this rejection is maintained.

Claims 21-22, 33-34, and 50 remain rejected under 35 U.S.C. 102(e) as being anticipated by Khvorova et al. for the reasons of record as set forth in the Office action mailed on September 16, 2008 and for the reasons stated below.

Applicant's arguments filed on March 16, 2009 have been fully considered but they are not persuasive. Applicant argues that SEQ ID NO:1360090 of Khvorova et al. does not possess the structural or functional requirements of claim 21, let alone SEQ ID NO:2079 of claim 50. Contrary to applicant's argument, the "first" nucleotide of SEQ ID NO:2079 is fully anticipated

by SEQ ID NO:1360090 of Khvorova et al., and the "second" nucleotide comprising a hairpin loop and two stem sequences wherein the two stem sequences are at least 30.8% complementary and each is 18-30 nucleotides in length, wherein the "second" nucleotide comprises the "first" nucleotide, wherein the "first" nucleotide inhibits target protein are taught by Khvorova et al. See paragraphs 0238, 0277. Hence, this rejection is maintained.

Claim Rejections - 35 USC § 103

Claims 21-34 and 50 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Ambro, Lai et al. and Knipe et al. for the reasons of record as set forth in the Office action mailed on September 16, 2008 and for the reasons stated below.

Applicant's arguments filed on March 16, 2009 have been fully considered but they are not persuasive. Applicant asserts that "miRNAs were believed to exist only in a few eukaryotic branches of the phylogenetic tree" and there is no evidence presented to suggest that one of ordinary skill in the art would have expected miRNAs to be present in viruses. Contrary to applicant's assertion, it was known in the art that miRNAs exist in various organisms and it was expected in the art that more miRNAs would be discovered in many other genomic sequences due to the rapid development and advancement in bioinformatics tools for identifying miRNA sequences for any known genomic sequence. See the teachings of Lai et al. It appears that applicant begs for absolute predictability that one must have known the existence of miRNAs in viral genomic sequences. Note that "Obviousness does not require absolute predictability of success." See *In re O'Farrell*, 853 F.2d 894, 7 USPQ2d 1673 (Fed. Cir. 1988) at 903. In addition, applicant's attention is directed to the fact that "A person of ordinary skill is also a

person of ordinary creativity, not an automation." See page 1397, *KSR International Co., v. Teleflex Inc.*, 82 USPQ2d 1385, 2007 (U.S. Supreme Court). Since miRNAs were being discovered not only in a simple organism *C. elegans*, but in different organisms as the miRNA research field progressed as evidenced by the teachings of Ambros, and since bioinformatics-based miRNA identification methods were available in the art as taught by Lai et al., one of ordinary skill in the art with creativity would have reasonably expected that miRNAs are likely to be present in viral genomic sequences as well and would have reasonably identified a miRNA precursor sequence comprising SEQ ID NO:2079 of the instant application by using the bioinformatics-based strategy of Lai et al. Since applicant's arguments do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited, this rejection is maintained.

Double Patenting

Claims 21-23, 25, 27-28, and 33-34 remain provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 34-37 of 10/707,003 for the reasons of record as set forth in the Office action mailed on September 16, 2008 and for the reasons stated below.

Applicant has not submitted arguments addressing supposed errors of this rejection, nor has filed a signed terminal disclaimer. Hence, this rejection is maintained.

Claims 21-23, 25, 27-28, and 33-34 remain provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 23, 36, 39 of 10/604,943 for the

reasons of record as set forth in the Office action mailed on September 16, 2008 and for the reasons stated below.

Applicant has not submitted arguments addressing supposed errors of this rejection, nor has filed a signed terminal disclaimer. Hence, this rejection is maintained.

Claims 21-23, 25, and 30-34 remain provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 22, 34, 46 of 10/604,943 for the reasons of record as set forth in the Office action mailed on September 16, 2008 and for the reasons stated below.

Applicant has not submitted arguments addressing supposed errors of this rejection, nor has filed a signed terminal disclaimer. Hence, this rejection is maintained.

New Rejections Necessitated by Amendment

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 21-34, 50, and 52-53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection.

The claims are either directly or indirectly amended or newly added to recite limitations that were not recited previously. Applicant has pointed out Tables 2, 3, and 4 of the specification; however, there does not appear to be a written description of the claim limitations "14-71 nucleotides", "30.8% complementary", "40.9% complementary", "-1.8 Kcal/mol" in the application as filed. Note that the specification does not disclose Tables 2, 3, 4, nor does the present application contains "self-extracting files" comprising "TABLE2.TXT", "TABLE3.TXT", and "TABLE4.TXT" as described on page 2 of the specification. Furthermore, even if the "self-extracting files" were appropriately submitted with the present application, the Tables 2, 3, and 4 would not be likely to show the structural limitations and specific parameters as claimed and "as a whole" since the Tables are described to contain "genomic sequences". See page 2 of the specification. That is, it is highly probable that applicant has performed "picking and choosing" from a myriad of different "genomic sequences" disclosed in the Tables and picked different sequences satisfying different and separate structural limitations. As such, the specific length parameters with the specific lower limitation (e.g., 14, 18, 50 nucleotides) and the specific upper limitation (71, 24, 120 nucleotides) as well as specific complementarity levels and energy levels "as a whole" are not likely supported by the "genomic sequences" in the manner provided by the first paragraph of 35 U.S.C. 112. Accordingly, the claim limitations are considered to introduce new matter which is not adequately described in the application as originally filed. Applicant has also pointed out paragraph 0018 for claims 52 and 53. Note that the instant specification does not contain paragraph numbers. Assuming that paragraph 0018 corresponds to paragraph 0018 of the published application, applicant is correct that paragraph 0018 discloses "18 to 24 nucleotides in length" and "50 to 120 nucleotides in length".

Nevertheless, claims 52 and 53 depend from claim 21, which contains new limitations not supported by the disclosure of the instant application. Hence, claims 52-53 are also considered to contain new matter that is not disclosed as originally filed.

Double Patenting

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 52-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 21 and 23 of 10/604,943 because the instantly claimed subject matter is anticipated by the subject matter in the reference claims. Note that the reference claims are "species" (SEQ ID NOs:128, 131, 133, 477, 480, 482) encompassed by the broad "genus" claims of the instant application.

Claims 52-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 34-35 of 10/707,003 because the instantly claimed subject matter is anticipated by the subject matter in the reference claims. Note that the reference claims are "species" (SEQ ID NOs:3588 and 863) encompassed by the broad "genus" claims of the instant application.

Claims 52-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 21 and 51 of 10/604,984 because the instantly claimed subject matter is anticipated by the subject matter in the reference claims. Note that the reference claims

are "species" (SEQ ID NOs:4642 and 1917) encompassed by the broad "genus" claims of the instant application.

Claims 52-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 17-18 of 10/708,952 because the instantly claimed subject matter is anticipated by the subject matter in the reference claims. Note that the reference claims are "species" (SEQ ID NOs:399424 and 14051) encompassed by the broad "genus" claims of the instant application.

Claims 52-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 26 and 35 of 10/709,739 because the instantly claimed subject matter is anticipated by the subject matter in the reference claims. Note that the reference claims are "species" (SEQ ID NOs:4204050 and 117937) encompassed by the broad "genus" claims of the instant application.

Claims 52-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 20 and 22 of 11/511,035 because the instantly claimed subject matter is anticipated by the subject matter in the reference claims. Note that the reference claims are "species" (SEQ ID NOs:906 and 3107) encompassed by the broad "genus" claims of the instant application.

Claims 52-53 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 4 of U.S. Patent in preparation for issuance from Application No. 10/604,942. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instantly claimed broad “genus” claims are anticipated by the viral miRNA species claims drawn to a 24-mer of SEQ ID NO:37405 and a 116-mer of SEQ ID NO:37404.

Claims 52-53 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent in preparation for issuance from Application No. 10/604,945. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instantly claimed broad “genus” claims are anticipated by the viral miRNA species claims drawn to a 24-mer of SEQ ID NO:5264 and a 69-mer of SEQ ID NO:2194.

Claim 53 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 2 of U.S. Patent No. 7,217,807 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instantly claimed broad “genus” claim is anticipated by the viral miRNA species claim drawn to a 77-mer SEQ ID NO:14.

Conclusion

No claim is allowed.

This application contains claims 35-48, 51, and 54-55 drawn to an invention nonelected with traverse in the reply filed on August 18, 2008. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANA SHIN whose telephone number is (571)272-8008. The examiner can normally be reached on Monday through Friday, 7am-3:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James (Doug) Schultz can be reached on 571-272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dana Shin
Examiner
Art Unit 1635

/J. E. Angell/
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